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(54) Title: MILD PARTICULATE LAUNDRY DETERGENT COMPOSITIONS FOR WASHING TEXTILE FABRICS BY HAND

(57) Abstract

Built particulate laundry detergent compositions mild to the skin, for washing textile fabrics by hand, contain a high-foaming anionic surfactant (for example, linear alkylbenzene sulphonate), plus one or more milder cosurfactants (for example, amine oxide plus ethoxylated nonionic surfactant, coco amidopropyl betaine).

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MILD PARTICULATE LAUNDRY DETERGENT COMPOSITIONS FOR WASHING TEXTILE FABRICS BY HAND

TECHNICAL FIELD

The present invention relates to a built particulate laundry detergent composition suitable for washing textile fabrics by hand, and to a handwash process utilising it. The composition of the invention is especially mild to the skin.

BACKGROUND AND PRIOR ART

Particulate laundry detergent compositions suitable for the handwash are well known. Since foam is seen as a desirable attribute in the handwash, such compositions generally contain quite high levels of highly-foaming anionic surfactants, notably alkylbenzene sulphonate. However, this surfactant, although scoring highly on both detergency and foaming, is not optimum with respect to mildness to the skin.

Anionic surfactants such as alkylbenzene sulphonates and primary alcohol sulphates are of course used also in detergent compositions intended for use in automatic washing machines, where foaming is less important and, in the case of drum-type (eg European front-loading) washing machines, is undesirable. In such compositions these anionic surfactants tend to be used at lower levels and are used in combination with lower-foaming cosurfactants, for example, ethoxylated alcohol nonionic surfactants, which boost

detergency without increasing foaming. These latter materials are not generally used in compositions intended for use in the handwash because of their detrimental effect on foaming.

It has now been found that if, in detergent compositions intended for the handwash, anionic surfactants such as alkylbenzene sulphonate are replaced to a limited extent by certain cosurfactants which are milder to the skin, in order to give compositions which are significantly milder, the expected loss of detergency and foaming performance does not occur. The preferred cosurfactants are amine oxides in conjunction with ethoxylated nonionic surfactants, and betaines such as cocoamidopropyl betaine.

PRIOR ART

JP 09 279 198A (Kao) discloses granular detergent compositions of high density containing 10-50 wt% of anionic surfactant and 1-20 wt% of amine oxide in a ratio of 1:1 to 100:1.

GB 993 044 (Unilever) discloses a high-foaming detergent composition, preferably a liquid, for dishwashing or light-duty laundry use, containing a foam-producing anionic or nonionic surfactant and an amine oxide in a ratio of from 0.02:1 to 1:1.

EP 328 361A (Unilever) discloses a laundry detergent composition, preferably a built powder, comprising anionic surfactant (preferably 4.5 to 18 wt%), a mixture of two ethoxylated nonionic surfactants having different HLB values (2-10 wt%), and a C_9-C_{22} amine oxide (1-4 wt%).

WP 97 33967A (Kao) discloses a granular laundry detergent composition containing anionic surfactant plus a specific type of amine oxide (amidoamine oxide).

EP 393 908A (Kao) discloses a laundry detergent composition, optionally in powder form, containing anionic or nonionic surfactant, plus ethoxylated amine oxide.

JP 05 247 495A (Dowa Yaku-So KK) discloses a solid detergent (tablet or powder) comprising anionic surfactant and cocoamidopropyl betaine in a ratio of 10:6-18.

DEFINITION OF THE INVENTION

The invention provides a process for laundering textile fabrics by hand, wherein fabrics are contacted with a wash liquor prepared by dissolving in water an effective amount of a built particulate detergent composition comprising:

(a) from 10 to 25 wt% of a high-foaming sulphonate or sulphate type anionic surfactant, preferably selected from linear alkylbenzene sulphonates and primary alcohol sulphates,

(b) from 1 to 10 wt% of a cosurfactant or combination of cosurfactants milder to the skin than the anionic surfactant (a),

the total amount of surfactants (a) and (b) being from 18 to 28 wt%, preferably from 18 to 25 wt%, and the ratio of surfactant (a) to surfactant (b) being within the range of from 1.5:1 to 20:1, preferably from 1.5:1 to 12:1,

(c) from 10 to 80 wt% of detergency builder,

(d) other detergent ingredients to 100 wt%.

The invention further provides a built particulate laundry detergent composition suitable for washing textile fabrics by hand, the composition comprising:

(a) from 10 to 25 wt% of a high-foaming sulphonate or sulphate type anionic surfactant, preferably selected from linear alkylbenzene sulphonates and primary alcohol sulphates,

(b) from 1 to 10 wt% of a cosurfactant or combination of cosurfactants milder to the skin than the anionic surfactant (a),

the total amount of surfactants (a) and (b) being from 18 to 28 wt%, preferably from 18 to 25 wt%, and the ratio of surfactant (a) to surfactant (b) being within the range of from 1.5:1 to 20:1, preferably from 1.5:1 to 12:1,

(c) from 10 to 80 wt% of detergency builder,

(d) other detergent ingredients to 100 wt%,

wherein the mildness to the skin of the composition is greater than that of a corresponding composition without surfactant (b) and containing the same amount or up to 13 wt% more of surfactant (a), and the stain removal performance of the composition is as good as or better than that of a corresponding composition without surfactant (b) and containing the same amount or up to 13 wt% more of surfactant (a).

For the purposes of the present invention the term "mild to the skin" is to be understood to indicate a reduced tendency to produce dryness and erythema on hands immersed in a wash liquor containing the composition in question.

DETAILED DESCRIPTION OF THE INVENTION

The handwash process

In the process of the invention, the built particulate detergent composition as defined above is dissolved in water to form a wash liquor with which the fabrics are contacted, preferably immersed. The concentration of the composition in the wash liquor is typically from 2 to 6 g/litre.

During this process the hands of the consumer are inevitably immersed in the wash liquor. It has been found that significantly less skin damage (dryness, erythema) on the hands was observed when compositions of the invention containing linear alkylbenzene sulphonate and a cosurfactant were employed, compared with control formulations without cosurfactant. The control formulations typically contained a similar or higher (up to 13 wt% higher) total level of surfactant, constituted wholly of anionic surfactant (linear alkylbenzene sulphonate).

The compositions of the invention thus contained less alkylbenzene sulphonate than the control formulations. However, surprisingly, the compositions of the invention showed no deterioration in detergency (stain removal) or foaming as compared with the control formulations.

The surfactant system

In the compositions of the invention, the high-foaming anionic surfactant (a) is present in an amount of from 10 to 25 wt%, preferably from 12 to 24 wt%, more preferably from 12 to 22 wt%.

The mild cosurfactant or cosurfactants (b) are present in a total amount of from 1 to 10%, preferably from 1.5 to 8 wt%.

The total surfactant content ranges from 18 to 28 wt%, preferably from 18 to 25 wt%, and the ratio of the anionic surfactant to the mild cosurfactant is within the range of from 1.5:1 to 20:1, preferably from 1.5:1 to 12:1, more preferably from 2:1 to 10:1.

The high-foaming anionic surfactant

Anionic surfactants are well-known to those skilled in the art. Examples of high-foaming sulphonate or sulphate type surfactants include alkylbenzene sulphonates, particularly linear alkylbenzene sulphonates having an alkyl chain length of C_8-C_{15}; primary and secondary alkylsulphates, particularly C_8-C_{15} primary alkyl sulphates; olefin sulphonates; alkyl xylene sulphonates; dialkyl sulphosuccinates; and fatty acid ester sulphonates. Sodium salts are generally preferred. Further information is given in the open literature, for example, in "Surface-Active Agents and Detergents", Volumes I and II, by Schwartz, Perry and Berch.

The preferred anionic surfactants are alkylbenzene sulphonates, more especially linear alkylbenzene sulphonate (LAS), which is preferably present in an amount of from 12

to 24 wt%, more preferably from 12 to 22 wt% and especially from 15 to 22 wt%.

Also of interest are primary alcohol sulphates (PAS), particularly C_8-C_{18}, preferably C_{12}-C_{15}, primary alcohol sulphates.

The mild cosurfactant

The mild cosurfactant is preferably chosen from amphoteric and zwitterionic surfactants. Nonionic or ethoxylated anionic surfactants may also be present.

Preferred amphoteric surfactants are amine oxides. These are materials of the general formula

$$R_1R_2R_3N\rightarrow O$$

wherein R_1 is typically a C_8-C_{18} alkyl group, for example, C_{12}-C_{14} alkyl, and R_2 and R_3, which may be the same or different, are C_1-C_3 alkyl or hydroxyalkyl groups, for example, methyl groups. The most preferred amine oxide is coco dimethylamine oxide.

Preferred zwitterionic surfactants are betaines, and especially amidobetaines.

Preferred betaines are C_8-C_{18} alkyl amidoalkylbetaines, for example, coco amidopropyl betaine (CAPB).

Nonionic surfactants that may be present include the primary and secondary alcohol ethoxylates, especially the C_8-C_{20} aliphatic alcohols ethoxylated with an average of from 1 to

20 moles of ethylene oxide per mole of alcohol, and more especially the C_{10}-C_{15} primary and secondary aliphatic alcohols ethoxylated with an average of from 1 to 10 moles of ethylene oxide per mole of alcohol.

Ethoxylated anionic surfactants, for example, alkyl ether sulphates (ethoxylated alcohol sulphates), may also be present.

Also suitable for use in the compositions of the present invention are C_8-C_{18} alkyl monoethanolamides, for example, coco monoethanolamide.

The following materials and combinations are especially preferred for use as cosurfactants in the compositions of the invention:

amine oxide plus ethoxylated nonionic surfactant
amine oxide
cocoamidopropyl betaine
cocoamidopropyl betaine plus alkyl ether sulphate

Preferred cosurfactant systems

An especially preferred cosurfactant system comprises:

(b)(i) from 0.5 to 5 wt%, preferably from 1 to 3 wt%, of amine oxide,

(b)(ii) from 1 to 5 wt%, preferably from 2 to 4 wt%, of an ethoxylated nonionic surfactant,

the total amount of (b)(i) and (b)(ii) being from 1.5 to 8 wt%, preferably from 2.5 to 6 wt% (all percentages being based on the detergent composition).

Another preferred mild cosurfactant (b) comprises a betaine, more preferably cocoamidopropyl betaine, present in an amount of from 1 to 5 wt%, preferably from 1.5 to 3.5 wt%.

Detergency builder

The compositions of the invention include a detergency builder. The compositions may suitably contain from 10 to 80%, preferably from 15 to 70% by weight, of detergency builder. Preferably, the quantity of builder is in the range of from 15 to 50% by weight.

The preferred inorganic builders are phosphates, more especially sodium tripolyphosphate. Other possible phosphate builders are sodium orthophosphate and pyrophosphate.

The most preferred detergency builder comprises sodium tripolyphosphate, preferably present in an amount of from 10 to 40 wt%, more preferably from 15 to 35 wt%, most preferably from 20 to 30 wt%.

Alternatively or additionally, the detergent compositions of the invention may contain as builder a crystalline alkali metal (preferably sodium) aluminosilicate (zeolite). Preferred zeolites are zeolite A (zeolite 4A), and zeolite MAP as described and claimed in EP 384 070B (Unilever) and commercially available as Doucil (Trade Mark) A24 from Crosfield Chemicals Ltd, UK.

As well as the phosphate or zeolite builders already mentioned, other inorganic or organic builders may be present.

Inorganic builders that may additionally be present include sodium carbonate, layered silicates, amorphous aluminosilicates.

Organic builders that may additionally be present include polycarboxylate polymers such as polyacrylates and acrylic/maleic copolymers; polyaspartates; monomeric polycarboxylates such as citrates, gluconates, oxydisuccinates, glycerol mono-, di- and trisuccinates, carboxymethyloxysuccinates, carboxymethyloxymalonates, dipicolinates, hydroxyethyl iminodiacetates, alkyl and alkenyl malonates and succinates; and sulphonated fatty acid salts.

Especially preferred organic builders are citrates, suitably used in amounts of from 5 to 30 wt %, preferably from 10 to 25 wt %; and acrylic polymers, more especially acrylic/maleic copolymers, suitably used in amounts of from 0.5 to 15 wt %, preferably from 1 to 10 wt %.
Builders, both inorganic and organic, are preferably present in alkali metal salt, especially sodium salt, form.

Decoupling polymer

According to one preferred embodiment of the invention, the compositions contain a low level, preferably from 0.02 to 5 wt%, more preferably from 0.05 to 2 wt% and most preferably about 1 wt%, of a decoupling polymer (deflocculating polymer).

The incorporation of decoupling polymer has been found to give enhanced stain removal on certain highly coloured stains, for example, rust.

Decoupling or deflocculating polymers are described in detail in EP 346 995A (Unilever). These polymers consist of a hydrophilic backbone and at least one hydrophobic side chain. Generic structures and preferred materials are disclosed exhaustively in EP 346 995A.

Preferred hydrophilic polymer backbones include polyacrylic, polymaleic, polytartronic, polycitric and polygluconic acids, and mixtures thereof, in acid or wholly or partially neutralised form. In especially preferred polymers, the hydrophilic backbone comprises acrylic or maleic units in acid or salt form. The most preferred hydrophilic backbone is polyacrylic acid.

The hydrophobic side chain preferably includes an alkyl or alkenyl chain containing at least 5 carbon atoms, and more preferably from 8 to 18 carbon atoms. Preferred hydrophobic monomers are C_8-C_{18} esters of methacrylic acid. The most preferred hydrophobic monomer is lauryl methacrylate.

The monomer ratio of hydrophilic monomer to hydrophobic monomer is preferably from 4:1 to 1000:1, more preferably from 6:1 to 250:1.

An especially preferred polymer is a copolymer of polyacrylic acid with lauryl methacrylate, otherwise referred to as poly(lauryl methacrylate-co-acrylate). The preferred monomer ratio of acrylic acid to lauryl methacrylate is about 25:1. This material is available

commercially as Narlex (Trade Mark) DC-1 from National Starch and Chemical Company.

In the detergent compositions of the invention, the decoupling polymer may suitaby be present in an amount of from 0.02 to 5 wt%, preferably from 0.05 to 2 wt%,

Other stain removal agents

The cleaning performance of the compositions of the invention may be further enhanced by the inclusion of an effective amount of another material giving a stain removal benefit. This material may be used either together with, or instead of, the decoupling polymer discussed above.

The amount of stain removal agent depends on the material chosen but is generally within the range of from 1 to 10 wt%.

Preferred stain removal agents are selected from the following list:

sequestrants, for example, nitrilotriacetic acid and its salts (NTA), typically used in amounts of from 0.5 to 5 wt%;

reducing bleaches, for example, sodium sulphite, typically used in amounts of from 5 to 10 wt%;

photobleaches, and especially metal phthalocyanine compounds.

Preferred photobleaches are aluminium and zinc phthalocyanines, preferably sulphonated aluminium and zinc

phthalocyanines. These materials may be suitably be used in amounts of from 0.0005 to 0.05 wt%, more preferably from 0.002 to 0.015 wt%. An especially preferred photobleach is aluminium phthalocyanine sulphonate (AlPCS), suitably in the form of a granule containing 0.1% AlPCS on a bentonite clay carrier, the granule suitably being used in amounts of from 0.5 to 5 wt% so that the active ingredient is present in an amount of from 0.0005 to 0.005 wt%. The granule is available commercially from Sŭd-Chemie AG as Laundrosil (Trade Mark) RT, containing 1% of Tinopal (Trade Mark) BBS (a 10 wt% aqueous solution of AlPCS available from Ciba Speciality Chemicals) dispersed on bentonite clay.

Other ingredients

The compositions of the invention also contain other ingredients conventionally present in handwash formulations, for example, inorganic salts such as sodium silicate and sodium sulphate; antiredeposition agents such as sodium carboxymethylcellulose; enzymes, for example, proteases, lipases, amylases, cellulases; fluorescer; perfume. This list is not intended to be exhaustive.

Manufacture of the detergent compositions

The compositions of the invention may be prepared by any suitable process.

The compositions may, for example, be prepared by the conventional process of spray-drying an aqueous slurry to form a base powder, then postdosing other ingredients, including any heat-sensitive materials. The high-foaming

anionic surfactant is generally included in the slurry. The mild cosurfactant or cosurfactants may also be included in the slurry, or postdosed by spraying on or as an adjunct on a carrier.

Also possible are wholly non-tower granulation processes, for example, using a high-speed mixer/granulator, or combination processes in which a spray-dried powder is subjected to post-tower granulation and/or densification or other non-tower treatment.

Rather than consisting of a traditional base powder plus postdosed ingredients, compositions of the invention may, if desired, be in the form of separate adjuncts or granules as described and claimed in WO 98 54286A, WO 98 54278A, WO 98 54281A and WO 98 54287A (Unilever).

The compositions of the invention may be of low, medium or high bulk density.

The incorporation of decoupling polymer, discussed previously, is especially advantageous in spray-dried powders. If included in the slurry, the polymer reduces slurry viscosity and improves slurry stability, allowing the preparation of processable and stable slurries of lower moisture content than would be possible in the absence of the polymer. Lower moisture content slurries require less energy for drying, and also allow an increased rate of production through the spray-drying tower.

Preferred embodiments of the invention

A first preferred composition of the invention comprises:

(a) from 10 to 25 wt%, preferably from 12 to 22 wt%, of linear alkylbenzene sulphonate,

(b) (i) from 0.5 to 5 wt%, preferably from 1 to 3 wt%, of amine oxide,

(ii) from 1 to 5 wt%, preferably from 2 to 4 wt%, of an ethoxylated nonionic surfactant,

the total amount of (b)(i) and (b)(ii) being from 1.5 to 8 wt%, preferably from 2.5 to 6 wt%,

the total amount of surfactants (a) and (b) being from 18 to 25 wt% and the ratio of surfactant (a) to surfactant (b) being within the range of from 1.5:1 to 12:1,

(c) from 15 to 35 wt%, preferably from 20 to 30 wt%, of sodium tripolyphosphate builder,

(d) other detergent ingredients to 100 wt%.

A second preferred embodiment of the invention comprises:

(a) from 10 to 25 wt%, preferably from 12 to 22 wt%, of linear alkylbenzene sulphonate,

(b) from 1 to 5 wt%, preferably from 1.5 to 3.5 wt%, of a betaine surfactant,

the total amount of surfactants (a) and (b) being from 18 to 25 wt% and the ratio of surfactant (a) to surfactant (b) being within the range of from 1.5:1 to 12:1,

(c) from 15 to 35 wt%, preferably from 20 to 30 wt%, of sodium tripolyphosphate builder,

(d) other detergent ingredients to 100 wt%.

Both preferred embodiments may advantageously further comprise, optionally,

(e) from 0.02 to 5 wt%, preferably from 0.05 to 2 wt%, of a decoupling polymer,

and/or

(f) from 0.5 to 5 wt% of nitrilotriacetic acid and/or a salt thereof (NTA).

EXAMPLES

The invention will now be illustrated by the following non-limiting Examples, in which parts and percentages are by weight unless otherwise stated. Compositions according to the invention are denoted by numbers, and comparative compositions by letters.

Detergent powders were prepared to the formulations given below, using conventional spray-drying and postdosing techniques.

The following abbreviations are used:

LAS	Linear alkylbenzene sulphonate
NI	Ethoxylated (7EO) C_{12}-C_{15} alcohol
AO	Coco dimethylamine oxide
LES	Ethoxylated coco alcohol sulphate
CAPB	Coco amidopropyl betaine
STP	Sodium tripolyphosphate
Sulphate	Sodium sulphate
Silicate	Sodium alkaline silicate
Carbonate	Sodium carbonate
Enzymes	Savinase/lipolase
Narlex DC1	Decoupling polymer, poly(lauryl methacrylate-co-acrylate)
NTA	trisodium nitrilotriacetate
Sulphite	Sodium sulphite
AlPCS	Aluminium phthalocyanine sulphonate, as Laundrosil RT granule containing 0.1 wt% active ingredient

Comparative Examples A and B:
formulations containing LAS without cosurfactant

	A	B
LAS	26.0	28.0
STP	25.5	28.0
Sulphate	14.7	10.2
Silicate	9.7	9.8
Carbonate	12.7	11.9
Enzymes	0.3	0.2
Perfume	0.3	0.3
Water and minors	10.8	11.6
Total	100.0	100.0

Examples 1 to 6: compositions containing amine oxide

	1	2	3	4	5	6
LAS	15.0	20.0	15.0	15.0	20.0	17.0
NI	3.0	2.0	5.0	5.0	-	-
AO	1.5	1.0	2.0	2.5	1.8	2.5
STP	24.0	24.0	24.0	20.0	28.0	28.0
Sulphate	23.0	19.5	19.0	22.5	15.2	17.5
Silicate	9.7	9.7	9.1	9.1	9.1	9.1
Carbonate	12.7	12.7	13.6	13.6	13.6	13.6
Enzymes	0.4	0.4	0.2	0.2	0.2	0.2
Perfume	0.3	0.3	0.3	0.3	0.3	0.3
Water/minors	10.5	10.5	11.8	11.8	11.8	11.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

The following Table shows the amounts and ratios of LAS and cosurfactants in Examples 1 to 6:

	(a)	(b)		Total	Ratio
	LAS	NI	AO	(a)+(b)	(a):(b)
1	15	3	1.5	19.5	3.33
2	20	2	1	23	6.67
3	15	5	2	22	2.1
4	15	5	2.5	22.5	2
5	20	-	1.8	21.8	11.1
6	17	-	2.5	19.5	6.80

Examples 7 to 11: compositions containing CAPB

	7	8	9	10	11
LAS	20.0	20.0	15.0	15.0	15.0
LES	-	-	-	5.0	5.0
CAPB	2.0	2.5	3.5	2.4	3.3
STP	26.0	28.0	28.0	24.0	20.0
Sulphate	18.5	14.5	18.5	18.6	21.7
Silicate	9.7	9.1	9.1	9.1	9.1
Carbonate	12.7	13.6	13.6	13.6	13.6
Enzymes	0.4	0.2	0.2	0.2	0.2
Perfume	0.3	0.3	0.3	0.3	0.3
Water/minors	10.5	11.8	11.8	11.8	11.8
Total	100.0	100.0	100.0	100.0	100.0

The following Table shows the amounts and ratios of LAS and cosurfactants in Examples 7 to 11:

Example	(a)	(b)		(a)+(b)	(a):(b)
	LAS	CAPB	LES		
7	20	2	-	22	10
8	20	2.5	-	22.5	8
9	15	3.5	-	18.5	4.29
10	15	2.4	5	22.4	2
11	15	3.3	5	23.3	1.76

Mildness testing

Compositions were assessed for mildness using an in-vitro method (zein solubilisation), and an in-vivo method (a hand immersion test).

Zein scores

Zein solubilisation is an in-vitro technique used for assessing skin mildness of surfactants for shampoos and other personal products.

The technique, described by E Gotte, Proc Int Congr Surface Active Subs, 4th, Brussels, 3, 83-90, (1964), uses the solubilisation of zein, the principal protein of the corn kernel, as a measure of the harshness of a surfactant or fully-formulated detergent composition. It is a test which correlates well with in-vivo tests and is relatively quick and easy to carry out.

The method used was essentially that described by Gotte but using 5 g rather than 2 g zein samples, and higher concentrations.

Since zein solubilisation is a measure of harshness, reciprocal values are quoted as a measure of mildness, and the higher the value, the milder the formulation. The compositions of the invention had reciprocal zein scores as follows:

Comparative Examples	
A	1.56
B	1.56
Amine oxide examples	
1	3.21
2	2.01
3	3.34
4	3.51
5	2.04
6	2.61
CAPB Examples	
7	1.95
8	1.93
9	2.88
10	2.05
11	2.00

Hand immersion test

20 panellists were used for each composition tested. Each panellist immersed one hand in a dilute (5 g/l) aqueous solution of a composition of the invention and the other hand in a dilute (5 g/l) solution of a control composition, for 30 minutes each day for four consecutive days. The solutions were maintained at temperatures within the 37.4 to 40.2°C range. Hand backs were visually assessed daily for dryness and erythema prior to each immersion and 24 hours after the final immersion, and allocated a grade of from zero to 4 according to the following scale:

Grade	Dryness	Erythema
0	none	none
1	slight flaking, generalised powderiness	mild, slight
2	moderate flaking/scaling, powderiness	moderate, confluent
3	marked scaling, heavy powderiness, lifting	marked
4	severe scaling, slight fissuring, heavy cracking and lifting scales	deep

Hand immersion test results

Examples 3, 4, 6 and 9 were evaluated against Comparative Example B using the methodology described above. All four compositions were significantly milder than the control.

Example 3 vs Comparative Example B

	Day 3	Day 4	Day 5
Dryness			
Example 3	1.61	1.75	1.89
Comp. Example B	1.68	2.07	2.11
Erythema			
Example 3	0	0.43	0.57
Comp. Example B	0.5	2.00	1.93

Example 4 vs Comparative Example B

	Day 3	Day 4	Day 5
Dryness			
Example 4	1.50	1.77	1.70
Comp. Example B	1.77	2.07	1.97
Erythema			
Example 4	0.17	0.73	1.00
Comp. Example B	0.40	1.37	1.57

Example 6 vs Comparative Example B

	Day 3	Day 4	Day 5
Dryness			
Example 6	1.88	2.00	2.15
Comp. Example B	1.88	2.42	2.50
Erythema			
Example 6	0.23	0.62	1.31
Comp. Example B	0.88	2.08	2.31

Example 9 vs Comparative Example B

	Day 3	Day 4	Day 5
Dryness			
Example 9	1.58	1.67	1.50
Comp. Example B	1.63	1.96	2.08
Erythema			
Example 9	0.58	0.71	0.42
Comp. Example B	1.25	1.96	1.79

Detergency

Detergency and redeposition properties of Examples 1, 2, 7 and Comparative Example A were compared using a tergotometer method.

The detergency work was conducted in a tergotometer using test cloths (uniformly stained fabric pieces).

The four samples were tested in one tergotometer with four pots. The experiment was repeated four times for each sample at the specified conditions. The test was randomised to minimize the effects between tergotometer pots. The test cloths were rinsed in hard water and steam ironed dry. The detergency work was conducted at two product dosage levels (1 and 3 g/litre). Wash conditions were as follows:

Tergo conditions :	100 rpm, 20 minute wash
Liquor:cloth ratio	33:1
Temperature :	ambient (about 25°C)
Water volume :	1 litre
Water hardness :	20°FH
Ballast :	Desized cotton

The water hardness was stressed to 20°FH and the lower product dosage of 1 g/litre were used to ensure the detergency would be evaluated under the worst possible wash conditions, while the higher product dosage of 3 g/litre represents a realistic dosage level in the handwash.

The test cloths used were as follows:

Test cloth 1		(fatty and particulate soil on cotton)
Test cloth 2		(fatty and particulate soil on cotton)
Test cloth 3	(WFK 20D)	(sebum on polyester/cotton)
Test cloth 4	(WFK 30D)	(sebum on polyester)

As monitors, three 7 cm x 7 cm pieces of each test cloth type were used per wash.

After the wash, each load was rinsed twice with 2 litres of water of the same hardness as that used for the wash (20°FH). The test cloth monitors were then removed, spin-dried for 1 minute then ironed.

Detergencies were evaluated by measurement of reflectance increase at 460 nm excluding UV, ΔR 460*, of all monitors. The results are shown in Tables 1 and 2 below.

There were no significant differences between the four examples.

Table 1: ΔR 460* detergency data at 1 gram per litre

Example	2	1	7	A
Test Cloth 1				
Run 1	11.72	12.32	10.1	11.76
Run 2	10.88	11.74	12.11	12
Run 3	12.82	13.75	12.68	13.11
Run 4	12.27	13.15	11.82	12.98
Average	11.92	12.74	11.68	12.46
Test Cloth 2				
Run 1	10.72	11.78	12.5	12.35
Run 2	10.72	12.14	10.46	12.19
Run 3	12.12	11.35	12.49	13.88
Run 4	9.32	9.86	10.39	10.71
Average	10.72	11.28	11.46	12.28
Test Cloth 3				
Run 1	14.56	15.17	13.7	14.69
Run 2	15.53	12.08	11.2	15.09
Run 3	12.63	12.07	12.69	14.06
Run 4	14.49	14.59	15.38	14.77
Average	14.30	13.48	13.24	14.65
Test Cloth 4				
Run 1	15.02	11.05	12.86	14.58
Run 2	15.3	14.74	14.15	15.11
Run 3	15.82	16.07	16.05	16.46
Run 4	16.37	17.73	14.4	17.36
Average	15.63	14.90	14.36	15.88

Table 2: ΔR 460* detergency data at 3 gram per litre

Example	2	1	7	A
Test Cloth 1				
Run 1	22.15	21.00	20.86	22.92
Run 2	24.61	21.65	22.65	22.60
Run 3	21.59	20.65	23.34	21.99
Run 4	21.66	21.92	24.01	22.31
Average	22.50	21.31	22.72	22.46
Test Cloth 2				
Run 1	17.85	16.69	18.98	15.11
Run 2	18.46	20.72	19.35	17.25
Run 3	15.02	16.42	17.74	15.26
Run 4	17.58	16.42	18.51	15.41
Average	17.23	17.56	18.65	15.76
Test Cloth 3				
Run 1	23.35	19.77	24.98	22.53
Run 2	24.23	23.42	22.78	21.93
Run 3	24.62	24.22	24.21	23.23
Run 4	23.57	24.47	24.27	24.39
Average	23.92	22.97	24.06	23.02
Test Cloth 4				
Run 1	21.40	20.67	22.72	20.40
Run 2	21.45	19.47	23.28	21.58
Run 3	21.35	22.03	20.91	18.49
Run 4	21.36	21.36	21.05	19.81
Average	21.39	20.88	21.99	20.07

5

Redeposition

Redeposition occurs when soils which are removed in the wash process settle back onto the fabrics.

Redeposition was examined using a tergotometer test method similar to that described above, using two different clean fabrics as monitors. Again, the reflectance change $\Delta R\ 460^*$ (in this case negative, ie an increase in reflectance) was used as the measure of soil redeposition.

Because redeposition is a cumulative effect, the methodology consisted of eight cumulative washes (the redeposition monitor was washed eight successive times in a redeposition wash solution). The test was randomised to minimize the effects between tergotometer pots.

The fabrics used as test monitors were as follows:

White 100% woven cotton
White pilled cotton interlock

Three 7 cm x 7cm pieces of each type of monitor were used per wash.

The soil used was carbon black (Aquadag), used in a large quantity (0.1 g/l) so that test conditions were stressed.

Wash conditions were as follows:

Product dosage :	3 grams per litre
Tergotometer speed :	100 rpm
Soil source :	0.1 g/l carbon black
Temperature :	Ambient (about 25°C)
Liquor:cloth ratio :	40:1
Water volume :	1 litre
Water hardness :	20°FH
Soak :	30 minutes
Wash time :	15 minutes
Ballast :	Desized cotton

After the wash, the monitors were sieved to remove the wash solution and then rinsed twice for 2 minutes in 1 litre of water at 10 °FH. They were then spin-dried for 2 minutes and tumble-dried for 10 minutes at 40°C.

Reflectance was measured after 4 washes and after 8 washes. The results were as shown in Tables 3 and 4.

It will be seen that the compositions of the invention performed as well, and under some conditions slightly better, than the control composition A.

Table 3: ΔR 460* redeposition after 4 washes

5

	2	1	7	A
100% cotton				
Run 1	-13.45	-14.17	-14.09	-15.46
Run 2	-15.49	-15.25	-15.44	-16.68
Run 3	-15.88	-15.82	-15.83	-15.97
Run 4	-12.46	-12.62	-13.92	-16.05
Average	-14.32	-14.47	-14.82	-16.04
Pilled cotton interlock				
Run 1	-8.41	-8.91	-8.59	-10.65
Run 2	-7.36	-7.27	-7.72	-8.31
Run 3	-7.10	-7.25	-7.23	-7.97
Run 4	-5.88	-6.14	-6.51	-8.22
Average	-7.19	-7.39	-7.51	-8.79

Table 4: ΔR 460* redeposition after 8 washes

	2	1	7	A
100% cotton				
Run 1	-17.81	-18.72	-19.50	-19.47
Run 2	-17.09	-18.8	-18.86	-20.34
Run 3	-19.89	-17.57	-19.01	-20.65
Run 4	-18.90	-19.32	-19.75	-21.12
Average	-18.42	-18.60	-19.28	-20.40
Pilled cotton interlock				
Run 1	-8.44	-8.86	-8.59	-10.32
Run 2	-7.17	-8.30	-8.53	-9.16
Run 3	-7.55	-7.91	-7.77	-9.38
Run 4	-8.45	-8.05	-7.65	-8.50
Average	-7.90	-8.28	-8.14	-9.34

Stain removal

Using a handwash procedure in which test monitors were included within a soiled washload, the stain removal performances of Examples 3 to 6, 8 to 11 and Comparative Example B in a single wash were compared.

The test monitors were as follows:

Savoury gravy sauce on cotton
Savoury gravy sauce on polyester/cotton
Tomato sauce on cotton
Tomato sauce on polyester/cotton

No significant differences were found between the products on any of the stains.

Foam

The amount of foam generated by hand agitation of each product (Examples 3 to 6, 8 to 11 and Comparative Example B) dosed at 3 g/litre into 20°FH water at 24°C was compared. The agitation regime was as follows: 20 seconds of gentle stirring, followed by 30 seconds of vigorous agitation. Foam height was then measured.

A handwash procedure was then used to wash a 2.0 kg of mixed soiled laundry at a liquor:cloth ratio of 7:1 (a 30 minute soak, followed by a 20 minute wash with rubbing). After removal of the washed load for rinsing, the wash liquor was agitated by hand for 30 seconds and the foam height was measured again.

The same wash liquor was then used to wash a second load, of 1.5 kg, using the same procedure. After removal of the washed load for rinsing, the wash liquor was agitated by hand for 30 seconds and the foam height was measured again.

Six runs were carried out and the results averaged. The averaged results are shown in Table 5 below.

Table 5: foam heights using hand agitation method

	Initial	After first wash	After second wash
3	11.7	4.6	2.8
4	12.3	5.3	2.2
5	14.2	5.5	3.7
6	15.0	6.8	3.9
8	12.2	5.7	3.8
9	13.5	5.3	3.3
10	11.8	6.5	4.8
11	14.0	6.5	4.0
B	15.0	5.7	4.3

It will be seen that, although there was variation between the compositions of the invention, the control was not consistently better.

Foam height and stability were also evaluated by a method involving mechanical agitation. Samples after the soak, after the first wash and after the second wash were taken and assessed as follows. A 1-litre sample was placed in a 2-litre glass beaker, stirred for 30 seconds using a twin-blade impeller the blades of which were just submerged below

the surface of the water, then stirred for a further 20 seconds using both the twin-blade impeller and a second, overhead stirrer. Both stirrers were then switched off, the impeller blade dropped to the bottom of the beaker so that it would not interfere with foam levels, the foam was levelled off and its height (cm) after 1 , 5, 10 and 15 minutes read. The results are shown in Table 6 below.

Table 6: foam heights using mechanical agitation method

	3	4	5	6	8	9	10	11	B
After soak									
1 min	1.8	2.0	2.4	2.2	1.8	1.8	2.3	2.3	2.3
5 min	1.7	1.8	2.3	2.2	1.7	1.7	2.1	2.3	2.1
10 min	1.6	1.7	2.3	2.0	1.6	1.6	2.1	2.1	1.8
15 min	1.5	1.7	2.2	2.0	1.6	1.6	2.1	2.1	1.6
After first wash									
1 min	1.4	1.1	1.4	1.4	1.5	1.3	1.9	1.2	1.8
5 min	1.4	1.0	1.3	1.4	1.4	1.3	1.8	1.2	1.6
10 min	1.2	1.0	1.2	1.3	1.3	1.2	1.7	1.1	1.4
15 min	1.1	1.0	1.1	1.2	1.3	1.1	1.7	0.9	1.1
After second wash									
1 min	0.9	0.7	0.7	1.0	1.2	0.9	1.4	0.9	1.3
5 min	0.9	0.6	0.7	0.9	0.9	0.8	1.4	0.8	1.2
10 min	0.8	0.6	0.6	0.8	0.9	0.8	1.3	0.7	1.0
15 min	0.8	0.6	0.6	0.8	0.9	0.7	1.3	0.7	1.0

Examples 12 to 19: compositions containing supplementary stain removal agents

	12	13	14	15	16	17	18	19
LAS	22.0	22.0	22.0	22.0	24.0	24.0	24.0	24.0
NI	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0
AO	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Narlex DC1	1.0	1.0	1.0	1.0				
STP	22.0	22.0	20.0	20.0	22.0	22.0	22.0	22.0
Sulphate	16.7	15.7	16.7	15.7	15.7	13.7	10.2	14.7
Silicate	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7
Carbonate	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Enzymes	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Perfume	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
NTA	2.0		2.0		2.0	1.0		
AlPCS		3.0		3.0		3.0		3.0
Sulphite							7.5	
Water and minors to	- - - - - - - 100.0 - - - - - - -							

The following Table shows the amounts and ratios of LAS and cosurfactants in Examples 12 to 19:

	(a)	(b)		Total	Ratio
	LAS	NI	AO	(a)+(b)	(a):(b)
12, 13	22	1.0	0.5	23.5	14.7
14, 15	22	2.0	0.5	24.5	8.8
16-19	24	1.0	0.5	25.5	16.0

Examples 20 to 23
effect of decoupling polymer on slurry processing

Slurries were prepared to the compositions shown in the following Table (in parts by weight).

The Table also shows slurry moisture content and slurry kinematic viscosity K (measured at a shear rate of 1 s^{-1}). The dramatic reduction of viscosity achieved by the incorporation of the decoupling polymer is readily apparent.

	20	21	22	23
LAS	24.0	24.0	22.0	22.0
NI	1.0	1.0	2.0	2.0
AO	0.5	0.5	0.5	0.5
STP	22.0	22.0	20.0	20.0
Sulphate	7.31	7.31	9.42	9.42
Silicate	9.7	9.7	9.7	9.7
Carbonate	1.35	1.35	1.24	1.24
SCMC, fluorescer	1.24	1.24	1.24	1.24
Narlex DC1			1.00	1.00
Total slurry parts	67.10	67.10	67.10	67.10
Slurry moisture content (wt%)	47.57	46.87	39.18	38.16
Kinematic viscosity K (Pa.s)	33.83	27.31	1.97	1.97

Examples 24 and 25

In this example, two slurries of otherwise identical composition, one containing Narlex DC1 polymer and the other without polymer, were prepared to substantially equal water contents and their viscosities measured.

	24	25
LAS	22.0	22.0
NI	2.0	2.0
AO	0.5	0.5
STP	20.0	20.0
Sulphate	9.42	9.42
Silicate	9.7	9.7
Carbonate	1.24	1.24
SCMC	1.04	1.04
Narlex DC1	1.0	
Total slurry parts	66.90	65.90
Slurry moisture content (wt%)	41.18	41.22
Kinematic viscosity K (Pa.s)	2.69	15.46

* * *

CLAIMS

1 A process for laundering textile fabrics by hand, characterised in that fabrics are contacted with a wash liquor prepared by dissolving in water an effective amount of a built particulate detergent composition comprising:

(a) from 10 to 25 wt% of a high-foaming sulphonate or sulphate type anionic surfactant,

(c) from 10 to 80 wt% of detergency builder,

(d) other detergent ingredients to 100 wt%,

characterised in that the composition further comprises

(b) from 1 to 10 wt% of a cosurfactant or combination of cosurfactants milder to the skin than the anionic surfactant (a),

the total amount of surfactants (a) and (b) being from 18 to 28 wt% and the ratio of surfactant (a) to cosurfactant (b) being within the range of from 1.5:1 to 20:1.

2 A process as claimed in claim 1, characterised in that the total amount of surfactants (a) and (b) is within the range of from 18 to 25 wt%.

3 A process as claimed in claim 1 or claim 2, characterised in that the ratio of surfactant (a) to cosurfactant (b) is within the range of from 1.5:1 to 12:1.

4 A process as claimed in any preceding claim, characterised in that the high-foaming anionic surfactant (a) is linear alkylbenzene sulphonate and is present in an amount of from 12 to 24 wt%, preferably from 12 to 22 wt%.

5 A process as claimed in any preceding claim, characterised in that the mild cosurfactant (b) comprises

(b)(i) from 0.5 to 5 wt%, preferably from 1 to 3 wt%, of amine oxide,

(b)(ii) from 1 to 5 wt%, preferably from 2 to 4 wt%, of an ethoxylated nonionic surfactant,

the total amount of (b)(i) and (b)(ii) being from 1.5 to 8 wt%, preferably from 2.5 to 6 wt%.

6 A process as claimed in any one of claims 1 to 4, characterised in that the mild cosurfactant (b) comprises a betaine present in an amount of from 1 to 5 wt%, preferably from 1.5 to 3.5 wt%.

7 A process as claimed in any preceding claim, characterised in that the detergent composition further comprises from 0.02 to 5 wt%, preferably from 0.05 to 2 wt%, of a decoupling polymer, preferably poly(lauryl methacrylate-co-acrylate).

8 A process as claimed in any preceding claim, characterised in that the detergent composition further comprises from 0.05 to 5 wt% of nitrilotriacetic acid and/or a salt thereof.

9 A built particulate laundry detergent composition suitable for washing textile fabrics by hand, the composition comprising:

(a) from 10 to 25 wt% of a high-foaming sulphonate or sulphate type anionic surfactant,

(c) from 10 to 80 wt% of detergency builder,

(d) other detergent ingredients to 100 wt%,

characterised in that the composition further comprises

(b) from 1 to 10 wt% of a cosurfactant or combination of cosurfactants milder to the skin than the anionic surfactant (a),

the total amount of surfactants (a) and (b) being from 18 to 28 wt% and the ratio of surfactant (a) to surfactant (b) being within the range of from 1.5:1 to 20:1,

further characterised in that the mildness to the skin of the composition is greater than that of a corresponding composition without surfactant (b) and containing the same amount or up to 13 wt% more of surfactant (a), and the stain removal performance of the composition is as good as or better than that of a corresponding composition without surfactant (b) and containing the same amount or up to 13 wt% more of surfactant (a).

10 A detergent composition as claimed in claim 9, characterised in that it comprises:

(a) from 10 to 25 wt%, preferably from 12 to 22 wt%, of linear alkylbenzene sulphonate,

(b) (i) from 0.5 to 5 wt%, preferably from 1 to 3 wt%, of amine oxide,

(ii) from 1 to 5 wt%, preferably from 2 to 4 wt%, of an ethoxylated nonionic surfactant,

the total amount of (b)(i) and (b)(ii) being from 1.5 to 8 wt%, preferably from 2.5 to 6 wt%,

the total amount of surfactants (a) and (b) being from 18 to 25 wt% and the ratio of surfactant (a) to surfactant (b) being within the range of from 1.5:1 to 12:1,

(c) from 15 to 35 wt%, preferably from 20 to 30 wt%, of sodium tripolyphosphate builder,

(d) other detergent ingredients to 100 wt%.

11 A detergent composition as claimed in claim 9, characterised in that it comprises:

(a) from 10 to 25 wt%, preferably from 12 to 22 wt%, of linear alkylbenzene sulphonate,

(b) from 1 to 5 wt%, preferably from 1.5 to 3.5 wt%, of a betaine surfactant,

the total amount of surfactants (a) and (b) being from 18 to 25 wt% and the ratio of surfactant (a) to surfactant (b) being within the range of from 1.5:1 to 12:1,

(c) from 15 to 35 wt%, preferably from 20 to 30 wt%, of sodium tripolyphosphate builder,

(d) other detergent ingredients to 100 wt%.

12 A detergent composition as claimed in any one of claims 9 to 11, characterised in that it further comprises from 0.02 to 5 wt%, preferably from 0.05 to 2 wt%, of a decoupling polymer, preferably poly(lauryl methacrylate-co-acrylate).

13 A detergent composition as claimed in any one of claims 9 to 12, characterised in that it further comprises from 0.5 to 5 wt% of nitrilotriacetic acid and/or a salt thereof.

* * *

INTERNATIONAL SEARCH REPORT

Inter nal Application No
PCT/GB 99/02500

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C11D17/06 C11D1/83 C11D1/94 //C11D1:12,C11D1:22, C11D1:72,C11D1:75,C11D1:90

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C11D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 05280 A (PROCTER & GAMBLE) 22 February 1996 (1996-02-22) claims 1-8,11	1-4,6,8, 9,11,13
Y	examples page 2, paragraph 2 page 32, paragraph 2	1,7,9,12
A	page 47, paragraph 1 - paragraph 3 ---	5,10
X	WO 96 01306 A (PROCTER & GAMBLE) 18 January 1996 (1996-01-18) claims 1-7,9,10	1-3,5,6, 8,9,13
Y	example 2	1,7,9,12
A	page 8, line 10 - line 29 ---	10,11
	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
2 November 1999	-8. 11. 1999

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Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Inter ›nal Application No
PCT/GB 99/02500

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	WO 95 35361 A (PROCTER & GAMBLE) 28 December 1995 (1995-12-28) claims 1-8 examples 12,13 page 1, paragraph 1 - paragraph 3	1-4,8,9, 13
Y		1,7,9,12
A	page 9, paragraph 3 -page 10, paragraph 1	5,6,10, 11

X	WO 98 20092 A (PROCTER & GAMBLE) 14 May 1998 (1998-05-14) abstract	1-4,9
Y	claims examples	1,7,9,12
A	page 13, paragraph 5	5,10

Y	WO 96 17919 A (COLGATE PALMOLIVE) 13 June 1996 (1996-06-13) claims 1-22 examples page 1, line 19 - line 34 page 7, line 6 -page 8, line 14	1,7,9,12

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Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

In. .ational application No.
PCT/GB 99/ 02500

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
See further information

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

The application discloses a particulate detergent composition comprising:
(a) specific anionic surfactant;
(b) co-surfactant(s);
(c) builder;
(d) balance ingredients.

In the claims 1-4 and 9, the co-surfactant (b) is only defined by a property, namely being milder to the skin than the anionic surfactant (a). For reasons of 'lack of clarity', the search has been restricted to the co-surfactants specified in respectively the claims (5,6,10,11), the examples and the description (p 7, ln 9 - p 9, ln 7).

In claims 7 and 12 it is stated that the composition further comprises a decoupling polymer. Again, a compound is defined by its property. For reasons of 'lack of clarity', the search has been restricted to the polymer as it is described in respectively the claims (7, 12), the examples and the description (p 10, ln 28 - p 12, ln 6).

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

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